

## Supplementary Information

### Preparation and catalytic properties of polydopamine-modified polyacrylonitrile fibers functionalized with silver nanoparticles

Xiaoyu Zhu <sup>a</sup>, Huiying Liu <sup>\*a</sup>, Yingying Wu <sup>a</sup>, Jing Ye <sup>a</sup>, Yacheng Li <sup>a</sup> and Zhendong Liu<sup>\* a</sup>

<sup>a</sup> College of Material Design and Engineering, Beijing Institute of Fashion Technology, Beijing 10029, P. R. China

Fax: +86-10-64288045; Tel: +86-10-64288045

E-mail: 20140006@bift.edu.cn; clylzd@bift.edu.cn

1. Table S1. Effects of functionalized fibers wrapped with different concentrations of dopamine on the catalytic reaction

The concentration of PDA solution(g/L)	The concentration of AgNO <sub>3</sub> solution(g/L)	n <sub>4-NP</sub> : n <sub>NaBH<sub>4</sub></sub>	Amount of cat. (mg)	solvent	T (°C)	t (min)	Yield (%)
0	1	1:10	40	H <sub>2</sub> O	35	30	14.7%
0.1	1	1:10	40	H <sub>2</sub> O	35	30	25.0%
0.5	1	1:10	40	H <sub>2</sub> O	35	30	95.2%
1.0	1	1:10	40	H <sub>2</sub> O	35	30	97.0%
2.0	1	1:10	40	H <sub>2</sub> O	35	30	95.1%

2. Table S2 Reaction activity of sodium borohydride reduced 4-NP catalyzed by fibers with different functional fiber dosage

Silver load	n <sub>4-NP</sub> : n <sub>NaBH<sub>4</sub></sub>	Amount of cat. (mg)	solvent	T (°C)	t (min)	Yield (%)
0.68%	1:10	5	H <sub>2</sub> O	35	-	-
0.68%	1:10	10	H <sub>2</sub> O	35	-	-
0.68%	1:10	20	H <sub>2</sub> O	35	60	69
0.68%	1:10	30	H <sub>2</sub> O	35	60	93
0.68%	1:10	40	H <sub>2</sub> O	35	17	97

3. Table S3. Exploring catalyst composition for catalytic reduction of nitrophenol

Composition of catalyst	$n_{4-NP} : n_{NaBH_4}$	solvent	T (°C)	t (min)	material	product
Ag	1:10	H <sub>2</sub> O	35	30min	98%	-
Ag + NaBH <sub>4</sub>	1:10	H <sub>2</sub> O	35	30min	-	90%
PAN-PDA + NaBH <sub>4</sub>	1:10	H <sub>2</sub> O	35	30min	93%	-
NaBH <sub>4</sub>	1:10	H <sub>2</sub> O	35	90min	95%	-

4. Table S4 Effects of the repetitive use of PAN-S-PDA-Ag catalyst on the reduction reaction

1		2		3		4		5	
t (min)	Yield (%)	t (min)	Yield (%)	t (min)	Yield (%)	t (min)	Yield (%)	t (min)	Yield (%)
13	96	40	95	26	92	47	99	32	99
13	92	23	95	42	91	207	97	37	95
13	78	30	95	67	96	177	91	37	97
6		7		8		9		10	
t (min)	Yield (%)	t (min)	Yield (%)	t (min)	Yield (%)	t (min)	Yield (%)	t (min)	Yield (%)
23	86	24	97	29	98	37	99	54	99
32	98	24	98	24	87	25	99	25	96
17	99	24	97	46	98	41	97	25	98

5. Figure S1 The cross section SEM of PAN-PDA

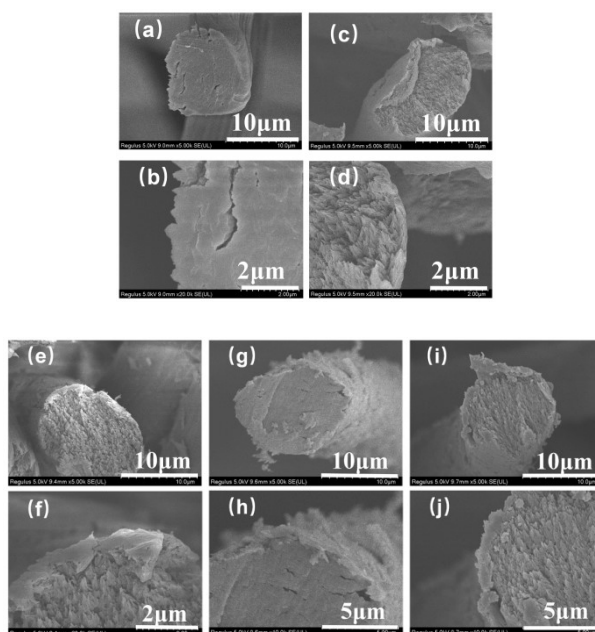


Figure S1 SEM images of the cross section of PAN fiber modified by different concentration of dopamine solution (a, b) 0 g/L (c, d) 0.1 g/L (e, f) 0.5 g/L (g, h) 1 g/L (i, j) 2 g/L

6. SEM images of the PAN-PDA-Ag used as catalyst after 10 cycles

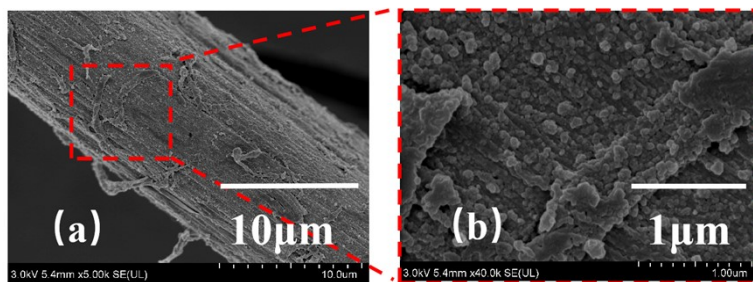


Figure S2 SEM images of the used PAN-PDA-Ag used as catalyst for 10 cycles